GERAGHTY
& MILLER, INC.
Environmental Services

DEC 1992

Ground Water *Hydrocarbon* *Remediation* *Education*

December 1, 1992

Mr. Michael V. Gaudette
Van Waters & Rogers Inc.
600 Hunter Drive
Suite 300
Oak Brook, IL 60521

Re: Report of Findings, Soil Sampling Investigation for the Former Hazardous Waste Storage Area, Van Waters & Rogers Inc., Bedford Heights, Ohio

Dear Mike:

Geraghty & Miller, Inc. (G&M) is pleased to submit to Van Waters & Rogers Inc. (VW&R) the analytical results from the recent soil sampling conducted at its Bedford Heights facility. This letter report summarizes the results of the soil sampling conducted in accordance with the Ohio Environmental Protection Agency's (OEPA) additional closure requirements specified in their July 23 and September 10, 1992 letters. The purpose of these soil sampling requirements was to determine the chemical quality of soil beneath the former hazardous waste storage area with respect to volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and alcohols. Representatives from VW&R and OEPA were present during the sampling activities.

Four soil borings were drilled beneath the concrete pad of the former storage area on October 5, 1992. Nine (9) soil samples (including one duplicate sample) were collected during the investigation. Each of the soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and alcohols as specified by the OEPA in their July 23, 1992 letter to VW&R.

PROJECT BACKGROUND

The VW&R Bedford Heights facility is a registered generator and transporter of hazardous waste and held a Part B permit for the operation of a small hazardous waste storage unit. The size of the hazardous waste storage unit is approximately 30 feet long by 10 feet wide and is located north and directly adjacent to the facility's loading dock (Figure 1). On April 12, 1988, VW&R submitted a Closure Plan for the unit to the OEPA. On October 18, 1988, VW&R requested the OEPA disregard this closure plan so VW&R could initiate a Part B closure of the drum storage area in accordance with the approved Part B closure plan; OEPA accepted the October 18, 1988 letter as notification of closure. On October 31, 1989, VW&R submitted

Van Waters & Rogers Inc.
subsidiary of **Univar**

600 HUNTER DRIVE
OAK BROOK, IL 60521-1926
PHONE (708) 573-4300
FAX (708) 573-2536

January 21, 1993

Mr. Murat Tukel
Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087-1969

RE: Soil Invetigation Reports
Bedford Heights, Cuyahoga County, Ohio
OHD 071 107 791

Dear Mr. Tukel:

Enclosed is Geraghty & Miller's report for the soil investigation completed as part of the RCRA closure requirements for the former hazardous waste storage area at the referenced facility.

Soil sampling methodologies and QA/QC protocols authorized during the investigation and soil analytical results are presented in this report. Tables and figures are used to summarize data, supporting documentation, including laboratory certificates of analysis, and chain of custody forms are attached to the letter.

Analytical data obtained from soil samples collected during October, 1992 and that some previous soil sampling activities are presented on Figure 1.

If you have any questions, please call me at (708) 573-4361 or leave a voice mail message at (800) 284-6264, extension 8455.

Very truly yours,

Michael V. Gaudette
Senior Project Manager

MVG:be

Enclosure

COPIES TO: Wayne Grotheer, Univar, Kirkland
Steve Bouchard, U. S. EPA, Region V
Robert D. Hickman, VW&R, Northern Region
Russell Karney, VW&R, Cleveland Area
File

to the OEPA a certification for final closure of the hazardous waste storage area. On November 19, 1991, representatives of the OEPA conducted a post-closure inspection of the unit and determined that further sampling of the storage pad was required as part of the closure requirements. On January 13, 1992, after review of the October 1989 final closure certification report, the OEPA requested that additional sampling be performed. VW&R submitted a sampling plan to the OEPA on February 14, 1992 to address these additional closure requirements.

The OEPA approved the VW&R sampling plan on March 9, 1992 with some minor modifications. These modifications included the analytical parameters to be examined as part of the Closure; the analytical parameters are given on Table 1. Sampling activities were initiated during April 1992 and a report of findings was submitted to the OEPA in June 1992. This report presented the analytical results for two concrete core samples (C-1 and C-2) and two soil samples (SB-1 and SB-2) collected from approximately 0 to 12 inches below the base of the concrete pad. VOCs were not detected in the soil sample collected from borehole SB-1 or in concrete sample C-2. Two VOCs, 1,1,1-trichloroethane and tetrachloroethylene, were each detected at 0.018 milligrams per kilogram (mg/kg) in the soil sample collected from borehole SB-2. Xylenes (total) were detected in concrete sample C-1 at 0.015 mg/kg.

The OEPA, after reviewing the June 1992 report, requested that an additional soil sampling and analysis plan be prepared for the former storage unit to address the VOCs detected in the soil samples collected during April 1992. This plan was required because VOCs were detected and the OEPA closure standard of background or non-detectable levels was not met. On August 19, 1992, VW&R submitted a soil sampling and analysis to the OEPA to address the additional closure requirements; the OEPA approved the plan with some minor modifications on September 10, 1992. The soil sampling activities were conducted on October 5, 1992.

METHODOLOGY

Four soil borings (SB-5 through SB-8) were advanced through the shallow soils beneath the concrete pad to an approximate depth of 3.5 feet on October 5, 1992 by G&M and VW&R personnel. These borings were located along stress fractures near the pad's eastern and western edges. The locations of the borings are depicted on Figure 1. A portable, electric-powered jack hammer was used to penetrate the concrete pad at each borehole location. A gasoline-powered generator, located downwind of the borehole locations, provided electricity to the jack hammer.

Soil samples were collected at approximately six inch intervals from each borehole using a hand auger. Soil from each six inch interval was extracted from the auger bucket and placed in a wide-mouth glass jar for headspace testing. The jar was sealed by placing an aluminum foil sheet and a screw-type cap over the jar's mouth. Volatile organic vapors that accumulated in

the jar's headspace were measured in the field using a Thermo Environmental Instruments Inc. Model 580B organic vapor analyzer calibrated to an isobutylene standard. The results of the field screening are presented on the soil boring logs included as an attachment to this letter. Each soil sample was also classified by the field representative for textural composition in accordance with the Unified Soil Classification System.

Samples from the 2 to 2.5 foot depth interval and from the 3 to 3.5 foot depth interval were submitted to a laboratory for analysis. These samples were collected by advancing the hand auger to the depth immediately above the sampled interval. The auger was then removed from the borehole, replaced with a clean auger, and re-inserted in the borehole. The auger was then advanced approximately six inches into the undisturbed soils and a soil sample retrieved. Upon retrieval, soil was extracted from the auger bucket and placed in pre-cleaned, laboratory supplied containers. Soil samples were stored at approximately 4° celsius for delivery to the analytical laboratory. A properly executed chain of custody accompanied the sample shipment to the laboratory.

Soil sampling equipment was cleaned at the site using an Alconox solution bath followed by a distilled water rinse, and allowed to air dry. All sampling equipment was cleaned before being used to collect each soil sample. A rinseate blank was collected to demonstrate the effectiveness of the equipment cleaning procedures.

Boreholes were abandoned upon completion of the sampling activities by grouting each to ground surface with cement. Wash water, cement and drill cuttings were placed in 5-gallon buckets and temporarily stored on-site pending appropriate off-site disposal.

PHYSICAL DESCRIPTION

Subsurface materials encountered beneath the former hazardous waste storage unit consist of brown clayey silt to silty clay. The water table was not encountered in any of the boreholes. Soil below a depth of approximately 24 inches was moist. The soil boring logs are included in this letter as an attachment.

FINDINGS

Nine soil samples, including a duplicate sample collected from borehole SB-6 (3 to 3.5 feet), were analyzed for the various organic compounds of interest (VOCs, SVOCs, and alcohols) utilizing SW 846 methods 8240, 8270, and 8015. Specific constituents analyzed are included in Table 1. Analytical work was performed by B.E.C. Laboratories, Inc. and Aqua Tech Environmental Laboratories, Inc. The analytical results are summarized on Table 2 and Figure 1; laboratory certificates of analyses and the chain of custody form are included as an attachment to this letter.

VOCs, SVOCs, and alcohols were not detected in samples collected from borehole SB-8 or from the 3 to 3.5 foot depth interval in borehole SB-5. SVOCs were not detected in any of the soil samples; methanol was detected at approximately the detection limit in the sample collected from the 1.5 to 2 foot depth interval in borehole SB-6. Alcohols were not detected in any of the other sampling intervals.

VOCs were detected in boreholes SB-5, SB-6, and SB-7. Tetrachloroethylene was detected at 5.94 micrograms per kilogram (ug/kg) in borehole SB-5 at a depth of 1.2 feet. Acetone and ethylbenzene were detected at 64.9 ug/kg and 539 ug/kg, respectively, and total xylenes were detected at an estimated concentration of 1.53 ug/kg in the sample collected from the 1.5 to 2 foot depth interval in borehole SB-6. The total xylene concentration is reported as an estimated concentration since the analyte was detectable but below the limit of quantification. The only VOC detected in the sample collected from the 3 to 3.5 foot depth interval in borehole SB-6 was ethylbenzene at a concentration of 87.2 ug/kg. Ethylbenzene was also the only VOC detected in the duplicate sample collected from this depth interval in borehole SB-6. Ethylbenzene was detected at 79.7 ug/kg in the duplicate sample.

Two VOCs, including acetone and 1,1,1-trichloroethane, were detected in borehole SB-7. Acetone was detected at an estimated concentration of 48.4 ug/kg in the sample collected from the 1.5 to 2 foot depth interval. As with the detection of total xylenes in borehole SB-6, the reported acetone concentration is below the laboratory quantification limit. The only VOC detected in the 3 to 3.5 foot sampling interval was 1,1,1-trichloroethane at a concentration of 37.8 ug/kg.

VOCs were not detected in the rinseate blank.

If you have any questions regarding this information, please do not hesitate to give me a call.

Respectfully Submitted,

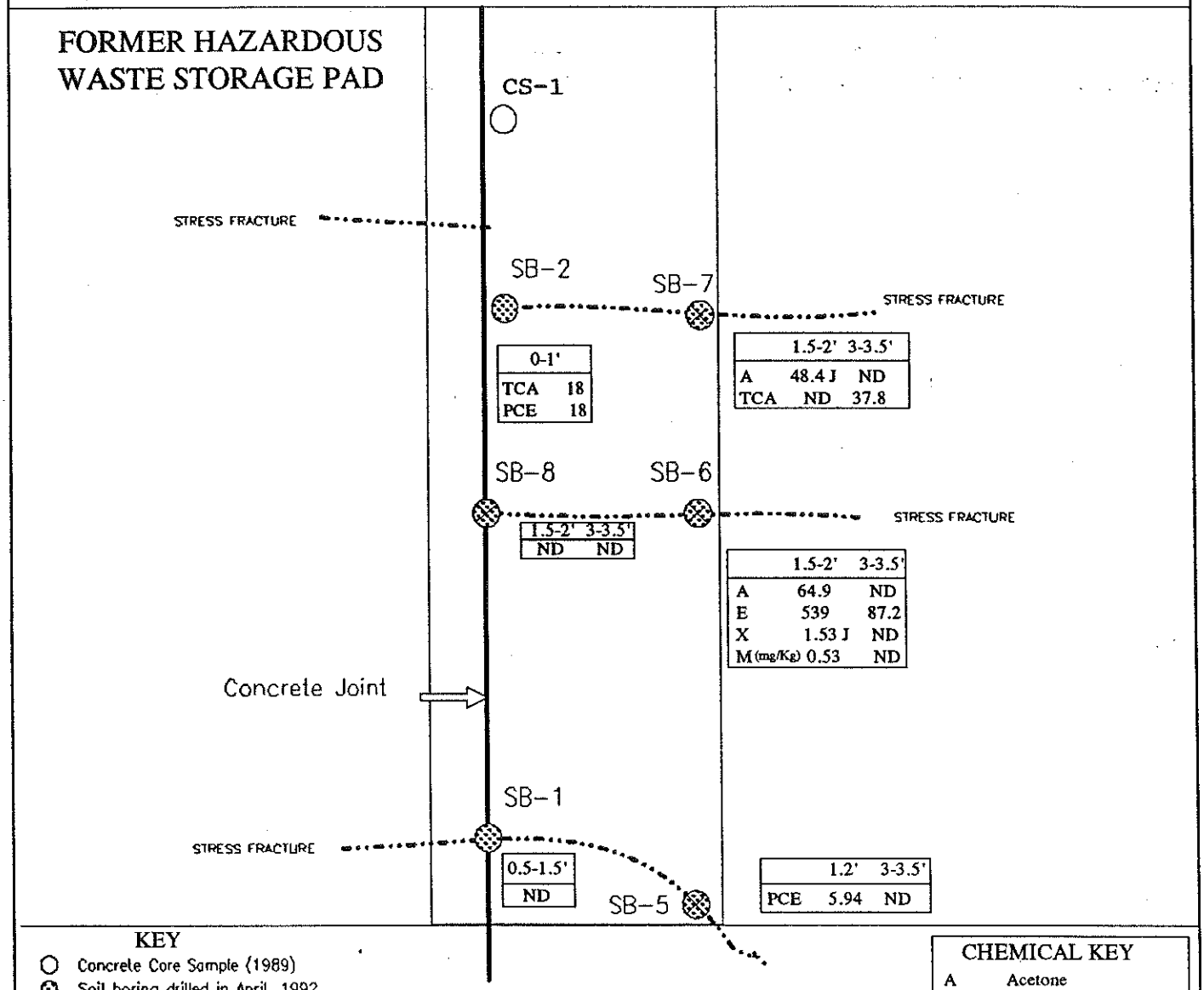
GERAGHTY & MILLER, INC.

Ken Stroebel

Kenneth H. Stroebel, CPG
Senior Scientist I

bedford.ltr

LOADING DOCK



KEY

- ○ Concrete Core Sample (1989)
- ⊗ Soil boring drilled in April, 1992
- ⊗ Soil boring drilled in October, 1992
- ND - Not detected
- J - Below laboratory quantitation limit; estimated value

All concentrations expressed as ug/Kg unless otherwise noted.

CHEMICAL KEY

A	Acetone
E	Ethylbenzene
X	Total Xylenes
M	Methanol (mg/Kg)
TCA	1,1,1-Trichloroethene
PCE	Tetrachloroethene

GERAGHTY & MILLER, INC.
Environmental Services

SCALE 0' 6'

SAMPLE LOCATION MAP
VAN WATERS & ROGERS, INC.
BEDFORD HEIGHTS, OHIO

FIGURE
1

TABLE 1
SAMPLE PARAMETER SUMMARY
HAZARDOUS WASTE STORAGE CONTAINER PAD
VAN WATERS & ROGERS INC.
BEDFORD HEIGHTS, OHIO

Compound	Method
Acetone	8240
Benzene	8240
n-Butyl Alcohol	8240
Carbon Disulfide	8240
Chlorobenzene	8240
Cyclohexanone	8240
Ethyl acetate	8240
Ethyl benzene	8240
Ethyl ether	8240
Isobutanol	8240
Methanol	8015
Methylene chloride	8240
Methyl ethyl ketone	8240
Methyl isobutyl ketone	8240
Nitrobenzene	8270
Tetrachloroethene	8240
1,1-Dichloroethene	8240
1,1,1-Trichloroethane	8240
1,1,2-Trichloroethane	8240
Toluene	8240
Total Xylenes	8240

TABLE 2
SUMMARY OF ANALYTICAL RESULTS
HAZARDOUS WASTE STORAGE CONTAINER PAD
VAN WATERS & ROGERS INC.
BEDFORD HEIGHTS, OHIO

Sample ID		SB-5	SB-5	SB-6	SB-6	SB-6D*
Date Collected		10/5/92	10/5/92	10/5/92	10/5/92	10/5/92
Media		Soil	Soil	Soil	Soil	Soil
Depth (feet)	Units	1.2	3-3.5	1.5-2	3-3.5	3-3.5
1,1,1-Trichloroethane	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Acetone	(ug/Kg)	< 0.05	< 0.05	64.9	< 0.05	< 0.05
Benzene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
n-Butyl Alcohol	(mg/Kg)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Disulfide	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Cyclohexanone	(ug/Kg)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethyl Acetate	(ug/Kg)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethyl Benzene	(ug/Kg)	< 0.005	< 0.005	539	87.2	79.7
Ethyl Ether	(ug/Kg)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isobutanol	(mg/Kg)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methanol	(mg/Kg)	< 0.5	< 0.5	0.533	< 0.5	< 0.5
hylene Chloride	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Methyl Ethyl Ketone	(ug/Kg)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl Isobutyl Ketone	(ug/Kg)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	(mg/Kg)	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
Tetrachloroethene	(ug/Kg)	5.94	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toluene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total Xylenes	(ug/Kg)	< 0.005	< 0.005	1.53 J	< 0.005	< 0.005

Notes:

mg/Kg = milligrams per kilogram
ug/L = micrograms per liter
ug/Kg = micrograms per kilogram
Samples analyzed by B.E.C. Laboratories, Inc. and Aqua Tech Environmental Laboratories, Inc. using the SW-846 methods listed in Table 1.
NA denotes not analyzed.
* - Duplicate sample of SB-6, 3-3.5'

TABLE 2
SUMMARY OF ANALYTICAL RESULTS
HAZARDOUS WASTE STORAGE CONTAINER PAD
VAN WATERS & ROGERS INC.
BEDFORD HEIGHTS, OHIO

Sample ID		SB-7	SB-7	SB-8	SB-8	RB100592
Date Collected		10/5/92	10/5/92	10/5/92	10/5/92	10/5/92
Media		Soil	Soil	Soil	Soil	Water*
Depth (feet)	Units	1.5-2	3-3.5	1.5-2	3-3.5	(ug/L)
1,1,1-Trichloroethane	(ug/Kg)	< 0.005	37.8	< 0.005	< 0.005	< 0.001
Acetone	(ug/Kg)	48.4 J	< 0.05	< 0.05	< 0.05	< 0.01
Benzene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
n-Butyl Alcohol	(mg/Kg)	< 1.0	< 1.0	< 1.0	< 1.0	NA
Carbon Disulfide	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
Chlorobenzene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
Cyclohexanone	(ug/Kg)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.02
Ethyl Acetate	(ug/Kg)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002
Ethyl Benzene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
Ethyl Ether	(ug/Kg)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002
Isobutanol	(mg/Kg)	< 1.0	< 1.0	< 1.0	< 1.0	NA
thanol	(mg/Kg)	< 0.5	< 0.5	< 0.5	< 0.5	NA
Methylene Chloride	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
Methyl Ethyl Ketone	(ug/Kg)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01
Methyl Isobutyl Ketone	(ug/Kg)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01
Nitrobenzene	(mg/Kg)	< 0.66	< 0.66	< 0.66	< 0.66	NA
Tetrachloroethene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
1,1-Dichloroethene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
1,1,2-Trichloroethane	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
Toluene	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001
Total Xylenes	(ug/Kg)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001

Notes:

mg/Kg = milligrams per kilogram
ug/L = micrograms per liter
ug/Kg = micrograms per kilogram
Samples analyzed by B.E.C. Laboratories, Inc. and Aqua Tech Environmental Laboratories, Inc. using the SW-846 methods listed in Table 1.
NA denotes not analyzed.
* - Duplicate sample of SB-6, 3-3.5'
RB100592 is a rinseate sample collected after borehole SB-6 was sampled.

Geraghty & Miller, Inc.
Attn: Kenneth Stroebel
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Cleveland, Ohio 44143

biological & environmental control laboratories, inc.
615 front street
toledo, ohio 43605
(419) 693-5307

1632 enterprise parkway
twinsburg, ohio 44087
(216) 425-8200

lab no. 92C02251
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-5 14"
10/5/92 1345

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

analysis: BASE NEUTRALS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	94.2%	35-114
2-Fluorobiphenyl	91.3%	43-116
p-Terphenyl-d14	91.2%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	

Geraghty & Miller, Inc.
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twinsburg, ohio 44087
(216) 425-8200

lab no. 92C02251
p.o. no.

Sample Description: CL032.01 - VAN WATERS
SB-5 14"
10/5/92 1345

Analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

Procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

Results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	< 5
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	5.94
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	109%	70-121
Toluene-d8	91.7%	81-117
4-Bromofluorobenzene	92.0%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	Edward Kleist

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lab no. 92C02
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-5 3-3.5
10/5/92 1405

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

analysis: BASE NEUTRALS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, M 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	86.9%	35-114
2-Fluorobiphenyl	93.5%	43-116
p-Terphenyl-d14	88.5%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	

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twinsburg, ohio 44087
(216) 425-8200

lab no.: 92C02252
p.o. no.:

sample description: CL032.01 - VAN WATERS
SB-5 3-3.5
10/5/92 1405

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	< 5
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	114%	70-121
Toluene-d8	91.3%	81-117
4-Bromofluorobenzene	91.5%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

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10/13/92	LNT	Edward J. Kurt

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(216) 425-8200

lab no. 92C0225j
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-6 1.5-2
10/5/92 1435

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	0.533 mg/Kg

analysis: BASE NEUTRALS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	94.2%	35-114
2-Fluorobiphenyl	90.2%	43-116
p-Terphenyl-d14	91.0%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	Edward Stuart

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(216) 425-8200

lab no. 92C02253
p.o. no.

Sample Description: CL032.01 - VAN WATERS
SB-6 1.5-2
10/5/92 1435

Analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

Procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

Results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	64.9
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	539
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5 (1.53)

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	120%	70-121
Toluene-d8	92.7%	81-117
4-Bromofluorobenzene	95.4%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	

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lab no. 92L02254
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-6 3-3.5
10/5/92 1455

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

analysis: BASE NEUTRALS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	94.0%	35-114
2-Fluorobiphenyl	90.4%	43-116
p-Terphenyl-d14	91.0%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	Edward Shuert

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lab no. 92C02254
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-6 3-3.5
10/5/92 1455

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	87.2
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	119%	70-121
Toluene-d8	92.2%	81-117
4-Bromofluorobenzene	91.8%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	Edward Kinst

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lab no. 92C02255
p.o. no.

Sample Description: CL032.01 - VAN WATERS
SB-6D 3-3.5
10/5/92 1455

Analysis: Alcohol: Methanol

Procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

Analysis: BASE NEUTRALS

Procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

Results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	90.8%	35-114
2-Fluorobiphenyl	93.9%	43-116
p-Terphenyl-d14	90.4%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	Edward Hunt

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lab no. 92C02255
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-6D 3-3.5
10/5/92 1455

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	79.7
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	119%	70-121
Toluene-d8	94.2%	81-117
4-Bromofluorobenzene	94.8%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	Edward Kinch

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lab no. 92C02256
p.o. no.

ample CL032.01 - VAN WATERS
escription: SB-7 1.5-2
10/5/92 1530

nalysis: Alcohol: Methanol

rocedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

nalysis: BASE NEUTRALS

roc re: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

esults:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	89.2%	35-114
2-Fluorobiphenyl	90.5%	43-116
p-Terphenyl-d14	89.6%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	Edward J. Kleist

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lab no
92C
p.o. no

sample description: CL032.01 - VAN WATERS
SB-7 1.5-2
10/5/92 1530

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50 (48.4)
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	< 5
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	116%	70-121
Toluene-d8	94.1%	81-117
4-Bromofluorobenzene	93.9%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	

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lab no. 92C02257
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-7 3-3.5
10/5/92 1550

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

analysis: BASE NEUTRALS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	91.3%	35-114
2-Fluorobiphenyl	90.1%	43-116
p-Terphenyl-d14	94.6%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	Edward Hurst

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lab no. 92C02257
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-7 3-3.5
10/5/92 1550

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	< 5
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	37.8
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	105%	70-121
Toluene-d8	93.1%	81-117
4-Bromofluorobenzene	91.4%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed: tech: approved by:

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lab no. 92C02
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-8 1.5-2
10/5/92 1615

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

analysis: BASE NEUTRALS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating S Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, M 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	90.3%	35-114
2-Fluorobiphenyl	93.4%	43-116
p-Terphenyl-d14	91.0%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	

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lab no. 92C02258
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-8 1.5-2
10/5/92 1615

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	< 5
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	86.8%	70-121
Toluene-d8	91.4%	81-117
4-Bromofluorobenzene	89.6%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	Edward Kleist

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lab no. 92C02259
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-8 3-3.5
10/5/92 1630

analysis: Alcohol: Methanol

procedure: The sample was analyzed for alcohols by direct injections onto a gas chromatograph equipped with a flame ionization detector. (Modified 8015)

COMPOUND	RESULT
Methanol	less than 0.5 mg/Kg

analysis: BASE NEUTRALS

pro ure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8270.

results:

BASE NEUTRALS	METHOD PQL (mg/Kg)	RESULT (mg/Kg)
Nitrobenzene	0.66	< 0.66

Surrogate Recovery - Base Neutrals

Compound	% Recovery	Acceptable Range
Nitrobenzene-d5	89.0%	35-114
2-Fluorobiphenyl	94.4%	43-116
p-Terphenyl-d14	88.4%	33-141

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/19/92	GJB/AMG	

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lab no. 92C02259
p.o. no.

sample description: CL032.01 - VAN WATERS
SB-8 3-3.5
10/5/92 1630

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Method 8240.

results:

COMPOUND	METHOD PQL (µg/Kg)	RESULT (µg/Kg)
Acetone	50	< 50
Benzene	5	< 5
Methyl Ethyl Ketone	50	< 50
Carbon disulfide	5	< 5
Chlorobenzene	5	< 5
Cyclohexanone	100	< 100
1,1-Dichloroethene	5	< 5
Ethyl acetate	10	< 10
Ethyl benzene	5	< 5
Ethyl ether	10	< 10
Methylene chloride	5	< 5
Methyl Isobutyl ketone	50	< 50
Tetrachloroethene	5	< 5
Toluene	5	< 5
1,1,1-Trichloroethane	5	< 5
1,1,2-Trichloroethane	5	< 5
Total Xylenes	5	< 5

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	109%	70-121
Toluene-d8	91.6%	81-117
4-Bromofluorobenzene	92.2%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	Edward Kinst

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lab no. 92C0226
p.o. no.

sample description: CL032.01 - VAN WATERS
RB100592
10/5/92 1510

analysis: GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS

procedure: The sample was analyzed as outlined in US EPA "Test Methods for Evaluating So Waste, Physical/Chemical Methods", SW-846, Third Edition, November, 1986, Met 8240.

results:

COMPOUND	METHOD PQL (µg/L)	RESULT (µg/L)
Acetone	10	< 10
Benzene	1	< 1
Methyl Ethyl Ketone	10	< 10
Carbon disulfide	1	< 1
Chlorobenzene	1	< 1
Cyclohexanone	20	< 20
1,1-Dichloroethene	1	< 1
Ethyl acetate	2	< 2
Ethyl benzene	1	< 1
Ethyl ether	2	< 2
Methylene chloride	1	< 1
Methyl Isobutyl ketone	10	< 10
Tetrachloroethene	1	< 1
Toluene	1	< 1
1,1,1-Trichloroethane	1	< 1
1,1,2-Trichloroethane	1	< 1
Total Xylenes	1	< 1

Surrogate Recovery - Volatile Organics

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-d4	91.3%	70-121
Toluene-d8	92.5%	81-117
4-Bromofluorobenzene	93.7%	74-121

1) A value reported as "less than" indicates the analyte was not detected. The number is the quantification limit for the sample.

2) A value in parenthesis following a "less than" value indicates the analyte was detectable but below the limit of quantification. The value is an estimate only.

date completed:	tech:	approved by:
10/13/92	LNT	Edward Sweet

B.E.C. Laboratories Quality Control Data
Methanol

Client: Geraghty & Miller, Inc.
Project Name: CL032.01 Van Waters
Matrix: Solid

Sample No.	Date Sampled*	Time Sampled*	Date Completed
92C02251	10/5/92	1345	10/13/92
92C02252	10/5/92	1405	10/13/92
92C02253	10/5/92	1435	10/13/92
92C02254	10/5/92	1455	10/13/92
92C02255	10/5/92	1455	10/13/92
92C02256	10/5/92	1530	10/13/92
92C02257	10/5/92	1550	10/13/92
92C02258	10/5/92	1615	10/13/92
92C02259	10/5/92	1630	10/13/92

Analyte	Method Blank	Method Spike	Matrix Spike %	Matrix Spike Dup %	RPD	Average %
Methanol	< 0.5 ug/L	113%	104.2%	104.0%	0.19%	104.1%

*Information as on Chain of Custody

Approved by: Edward Theriot
Date: 10-14-92

B.E.C. Laboratories Quality Control Data
Volatile Organic Compound

Client: Geraghty & Miller, Inc.
Project Name: CL032.01 Van Waters
Matrix: Solid
Batch: C9-0012
Lab No.: 92C02251-92C02259

Compound	Matrix Spike %	Matrix Spk Dup %	RPD	AVG
Benzene	116%	117%	1.23%	116%
Carbon Tetrachloride	105%	99.2%	5.81%	102%
Chlorobenzene	118%	120%	1.61%	119%
Chloroform	105%	98.9%	6.29%	102%
1,4-Dichlorobenzene	103%	102%	0.58%	103%
1,2-Dichloroethane	134%	145%	7.44%	140%
1,1-Dichloroethene	103%	98.0%	5.31%	101%
Methyl Ethyl Ketone	88.7%	105%	16.5%	96.6%
Tetrachloroethene	108%	110%	1.98%	109%
Trichloroethene	113%	115%	2.06%	114%
Vinyl Chloride	81.0%	78.2%	3.47%	79.6%
Toluene	114%	116%	1.86%	115%
Surrogates				
1,2-Dichloroethane-d4	108%	116%	7.10%	112%
Toluene-d8	93.0%	92.9%	0.11%	93.0%
4-Bromofluorobenzene	93.1%	93.6%	0.54%	93.4%

Approved by: Edward Short
Date: 10-14-92

B.E.C. Laboratories Quality Control Data
Volatile Organic Compound

Client: Geraghty & Miller, Inc.
Project Name: CL032.01 Van Waters
Matrix: Liquid
Batch: C9-0014
Lab No.: 92C02260

Compound	Matrix Spike %	Matrix Spk Dup %	RPD	AVG
Benzene	113%	116%	1.93%	114%
Carbon Tetrachloride	115%	113%	1.96%	114%
Chlorobenzene	116%	119%	2.67%	117%
Chloroform	109%	106%	2.88%	108%
1,4-Dichlorobenzene	112%	115%	2.56%	113%
1,2-Dichloroethane	126%	131%	3.97%	128%
1,1-Dichloroethene	109%	104%	4.57%	106%
Methyl Ethyl Ketone	85.1%	88.6%	4.10%	86.9%
Tetrachloroethene	111%	111%	0.33%	111%
Trichloroethene	115%	117%	1.57%	116%
Vinyl Chloride	88.0%	85.5%	2.80%	86.8%
Toluene	111%	113%	0.97%	112%
Surrogates				
1,2-Dichloroethane-d4	99.3%	103%	3.70%	101%
Toluene-d8	92.4%	93.5%	1.18%	93.0%
4-Bromofluorobenzene	94.8%	96.5%	1.78%	95.7%

Approved by: Edward Hiscot
Date: 10-14-92

B.E.C. Laboratories Quality Control Data
Semi-Volatiles

Client: Geraghty & Miller, Inc.
Project Name: CL032.01 Van Waters
Matrix: Solid
Batch: QMS296
Lab No.: 92C02251-92C02259

Compound	Matrix Spike %	Matrix Spike Dup %	RPD	AVG %
Phenol	74.8%	81.7%	8.82%	78.3%
2-Chlorophenol	80.7%	92.0%	13.1%	86.4%
1,4-Dichlorobenzene	81.5%	90.8%	10.8%	86.2%
n-Nitroso-di-n-propylamine	81.2%	91.0%	11.4%	86.1%
1,2,4-Trichlorobenzene	93.3%	102%	8.91%	97.7%
4-Chloro-3-methylphenol	91.4%	97.2%	6.15%	94.3%
Acenaphthene	89.5%	97.6%	8.66%	93.6%
4-Nitrophenol	63.6%	79.6%	22.4%	71.6%
2,4-Dinitrotoluene	71.6%	84.0%	15.9%	77.8%
Pentachlorophenol	73.0%	87.2%	17.7%	80.1%
Di-n-butylphthalate	89.5%	101%	12.1%	95.3%
Pyrene	96.1%	109%	12.6%	103%
Lindane	89.2%	100%	11.4%	94.6%
Heptachlor	84.8%	95.2%	11.6%	90.0%
Aldrin	77.8%	89.2%	13.6%	83.5%
4,4'-DDT	71.2%	86.3%	19.2%	78.8%
Surrogates				
2-Fluorophenol	78.9%	86.8%	9.54%	82.9%
Phenol-d6	89.8%	92.5%	2.96%	91.2%
Nitrobenzene-d5	78.1%	88.9%	12.9%	83.5%
2-Fluorobiphenyl	84.2%	91.3%	8.09%	87.8%
2,4,6-Tribromophenol	70.9%	83.0%	15.7%	77.0%
p-Terphenyl d14	80.5%	89.2%	10.2%	84.9%

Approved by: Edward Hunt
Date: 10-21-92

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. ________

CHAIN-OF-CUSTODY RECORD

Project Number: CL032.01

Project Location: Van Waters

Laboratory: ATEL

Sampler(s)/Affiliation: J. Ellermeyer / G&M

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	N-Butyl Alcohol / Isobutanol VIA 8240									TOTAL
SB-5 14"	S	10-5-92 1345		1									1
SB-5 3-3.5	S	10-5-92 1405		1									1
SB-6 1.5-2	S	10-5-92 1435		1									1
SB-6 3-3.5	S	10-5-92 1455		1									1
SB-6D 3-3.5	S	10-5-92 1455		1									1
SB-7 1.5-2	S	10-5-92 1530		1									1
SB-7 3-3.5	S	10-5-92 1550		1									1
SB-8 1.5-2	S	10-5-92 1615		1									1
SB-8 3-3.5	S	10-5-92 1630		1									1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 9

Relinquished by: John C. Ellermeyer [illegible]	Organization: Geraghty & Miller Inc.	Date 10/06/92	Time [illegible]	Seal Intact? Yes (No) N/A
Received by: [illegible]	Organization: [illegible]	Date [illegible]	Time [illegible]	
Relinquished by:	Organization:	Date / /	Time	Seal Intact? Yes No N/A
Received by:	Organization:	Date / /	Time	

Special Instructions/Remarks: ________

Delivery Method: ☐ In Person ☐ Common Carrier ________ (SPECIFY) ☒ Lab Courier ☐ Other ________ (SPECIFY)

G&M Form 09.9.91

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number CL032.01

Project Location Vandenberg AFB

Laboratory BLC

Sampler(s)/Affiliation J. Ellermeyer / G&M

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	SAMPLE BOTTLE / CONTAINER DESCRIPTION: 8240	8270	8015 Modified							TOTAL
SB-5 14'	S	10-5-92 1515		✓	✓	✓							1
SB-5 2-2.5	S	10-5-92 1445		✓	✓	✓							1
SB-6 1.5-2	S	10-5-92 1425		✓	✓	✓							1
SB-6 3-3.5	S	10-5-92 1425		✓	✓	✓							1
SB-6D 3-3.5	S	10-5-92 1455		✓	✓	✓							1
SB-7 1.5-2	S	10-5-92 1510		✓	✓	✓							1
SB-7 3-3.5	S	10-5-92 1550		✓	✓	✓							1
SB-8 1-2	S	10-5-92 1615		✓	✓	✓							1
SB-8 3-3.5	S	10-5-92 1630		✓	✓	✓							1
RB100592	L	10-5-92 1510		✓									3
												Total No. of Bottles/ Containers	12

Sample Code: L = Liquid; S = Solid; A = Air

Relinquished by: John Ellermeyer	Organization: Geraghty & Miller	Date 10/6/92	Time 1555	Seal Intact? Yes (No) N/A
Received by: John E Meyer	Organization: [illegible]	Date 10/7/92	Time 1420	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☐ Common Carrier _____ (SPECIFY) ☒ Lab Courier ☐ Other _____ (SPECIFY)

AQUA TECH ENVIRONMENTAL LABORATORIES, INC.

P.O. BOX 76
MELMORE, OHIO 44845
(419) 397-2659

CLIENT: GERAGHTY AND MILLER

ADDRESS: ATTN: J ELLERMEYER
250 BETA DRIVE SUITE G
CLEVELAND ,OH 44143

PROJECT NO.: CL032.01

DATE OF INITIAL RECEIPT AT LABORATORY: 10/08/92

PURCHASE ORDER: CL032.01

COMMENTS:

SAMPLE INVENTORY

ATEL NO.	CLIENT NO.	METHOD(S)
92-15748-MEL	SB-5 14	SW-846; 8015
92-15749-MEL	SB-5 3-3.5	SW-846; 8015
92-15750-MEL	SB-6 1.5-2	SW-846; 8015
92-15751-MEL	SB-6 3-3.5	SW-846; 8015
92-15752-MEL	SB-6D 3-3.5	SW-846; 8015
92-15753-MEL	SB-7 1.5-2	SW-846; 8015
92-15754-MEL	SB-7 3-3.5	SW-846; 8015
92-15755-MEL	SB-8 1.5-2	SW-846; 8015
92-15756-MEL	SB-8 3-3.5	SW-846; 8015

COMMENTS:

AUTHORIZED SIGNATURE: Robert A. Kowalsky/MS

TITLE: MELMORE LABORATORY MANAGER
DATE RELEASED: OCT. 26 1992

Aqua Tech Environmental Laboratories, Inc.

Melmore Laboratory
P.O. Box 76
Melmore, Ohio 44845

Telephone: (419) 397-2659

Client: GERAGHTY AND MILLER
Sample Type: SOIL
Date Recieved: 10/08/92
Date Extracted: 10/21/92
Date Analyzed: 10/22/92

Method: SW-846; 8015
Percent Solids:
Analyst: JGC
Project No.: CL032.01
Units: mg/kg (ppm) dry wt.

Landban Alcohols by Gas Chromatography

ATEL SAMPLE	Client Description	Isobutanol	n-Butanol
92-15748-MEL	SB-5 14	< 1.0	< 1.0
92-15749-MEL	SB-5 3-3.5	< 1.0	< 1.0
92-15750-MEL	SB-6 1.5-2	< 1.0	< 1.0
92-15751-MEL	SB-6 3-3.5	< 1.0	< 1.0
92-15752-MEL	SB-6D 3-3.5	< 1.0	< 1.0
92-15753-MEL	SB-7 1.5-2	< 1.0	< 1.0
92-15754-MEL	SB-7 3-3.5	< 1.0	< 1.0
92-15755-MEL	SB-8 1.5-2	< 1.0	< 1.0
92-15756-MEL	SB-8 3-3.5	< 1.0	< 1.0

METHOD DETECTION LIMIT STUDY SOILS

ISOBUTANOL INST.#1 10/22/92

CONC.	AREA	Rf	MEAN Rf	%RSD
0.86	4885	1.80E-04		
1.7	9769	1.80E-04		
8.6	48843	1.80E-04	1.70E-04	2.9
17.2	105525	1.60E-04		
34.4	201680	1.70E-04		
68.8	408724	1.70E-04		

Regression Output:

Constant	-305.729
Std Err of Y Est	2387.703
R Squared	0.99981
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	5938.434
Std Err of Coef.	40.91534

n-BUTYL ALCOHOL (BUTANOL)

CONC.	AREA	Rf	MEAN Rf	%RSD
0.78	4285	1.80E-04		
1.56	8557	1.80E-04		
7.8	42357	1.80E-04	1.80E-04	3.2
15.6	93467	1.70E-04		
31.2	175788	1.80E-04		
62.4	351369	1.80E-04		

Regression Output:

Constant	622.9397
Std Err of Y Est	2815.666
R Squared	0.999643
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	5631.686
Std Err of Coef.	53.20378

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. ______

CHAIN-OF-CUSTODY RECORD

Project Number CL032.01
Project Location VAN WATERS
Laboratory ATEL
Sampler(s)/Affiliation J. Ellermeyer G&M

SAMPLE BOTTLE / CONTAINER DESCRIPTION

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	N-Butyl Alcohol Isobutanol ~~VA 8240~~	~~deleted per JSG 10/8/92~~ KJB 10/8/92								TOTAL
SB-5 14"	S	10-5-92 1345		1									1
SB-5 3-3.5	S	10-5-92 1405		1									1
SB-6 1.5-2	S	10-5-92 1435		1									1
SB-6 3-3.5	S	10-5-92 1455		1									1
SB-6D 3-3.5	S	10-5-92 1455		1									1
SB-7 1.5-2	S	10-5-92 1530		1									1
SB-7 3-3.5	S	10-5-92 1550		1									1
SB-8 1.5-2	S	10-5-92 1615		1									1
SB-8 3-3.5	S	10-5-92 1630		1									1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 9

Relinquished by: John C. Ellermeyer	Organization: Geraghty & Miller	Date 10/06/92	Time 1715	Seal Intact? Yes (No) N/A
Received by: Gordon G. Geis	Organization: Aqua Tech	Date 10/06/92	Time 1030	
Relinquished by: Gordon G. Geis	Organization: Aqua Tech	Date 10/7/92	Time 1345	Seal Intact? Yes (No) N/A
Received by: [illegible]	Organization: Aqua Tech	Date 10/8/92	Time 11 30	

Special Instructions/Remarks: 1ppm LDL needed, include Detection Limit Study With Report

Delivery Method: ☐ In Person ☐ Common Carrier ______ (SPECIFY) ☒ Lab Courier ☐ Other ______ (SPECIFY)

GERAGHTY & MILLER, INC.
Environmental Services

SOIL BORING LOG

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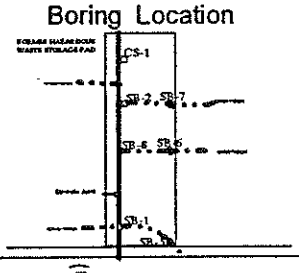
Boring Location



Project No.: CL032.02
Logged by: J. Ellermeyer
Drilling Co.:
Driller:

Date Drilled: October 5, 1992
Drilling Meth.: Hand Auger
Sample Meth.: Hand Auger

Depth (ft)	Samples	PID (ppm)	Graphic Log	DESCRIPTION
0		0.0		Concrete
1		0.0		Brown FILL, silty clay, gravel, dry
2				Brown Silty Clay to Silty Clay, dry
3		0.0		Brown Clayey Silt, dry to moist
4				
5				
6				

GERAGHTY & MILLER, INC.
Environmental Services

SOIL BORING LOG

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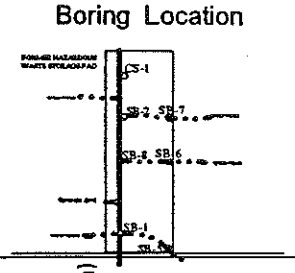
Boring Location



Project No.: CL032.02
Logged by: J. Ellermeyer
Drilling Co.:
Driller:

Date Drilled: October 5, 1992
Drilling Meth.: Hand Auger
Sample Meth.: Hand Auger

Depth (ft)	Samples	PID (ppm)	Graphic Log	DESCRIPTION
0				Concrete
1		123.7		Brown FILLand Silty Clay , dry
		103.6		Brown to gray-black Clayey Silt to Silty Clay , dry to moist, odor
2				
3				Brown Clayey Silt, moist
4				
5				
6				

Notes:

Duplicate sample collected from 36-42 inches.
Rinseate blank sample collected from auger used to sample the 36-44 inch interval.

GERAGHTY & MILLER, INC.
Environmental Services

SOIL BORING LOG

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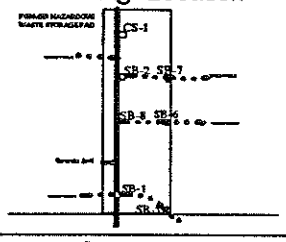
Boring Location



Project No.: CL032.02
Logged by: J. Ellermeyer
Drilling Co.:
Driller:

Date Drilled: October 5, 1992
Drilling Meth.: Hand Auger
Sample Meth.: Hand Auger

Depth (ft)	Samples	PID (ppm)	Graphic Log	DESCRIPTION
0				Concrete
1				Brown sandy Silt, some clay, dry
2		0.0		Brown to black clayey Silt, dry to moist
3		0.5		Brown Clayey Silt, dry to moist
4				
5				
6				